December 2002 Monthly Progress Report

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Curator: *Natalie Jaquith*
Responsible Official: *Dr. Joseph H. King, Code 633*
Last Revised: *Friday, 17-Jan-2003 10:15:07 EST [NAB]*

Task Assignment 99-001-00
December 2002

MANAGEMENT
GSFC ATR - Dr. J. Green
Raytheon ITSS Task Leader - L. Mayo
Raytheon ITSS Group Manager - L. Mayo

TASK OBJECTIVE: The non-personal services required under this task include performing all necessary functions to manage Raytheon ITSS contract staff supporting the Space Science Data Operations Office (SSDOO). The Raytheon ITSS management team will meet with the SSDOO management team to discuss significant events and contract highlights to be presented to upper management and Headquarters, and current contract issues and concerns.

SIGNIFICANT EVENTS:

- Staff held weekly senior staff meetings.
- Staff held weekly science data centers symposium planning meetings.
- Staff held all hands meeting and holiday party.

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Curator: *Natalie Jaquith*
Responsible Official: *Dr. Joseph H. King, Code 633*
Last Revised: *Friday, 17-Jan-2003 14:56:32 EST [NAJ]*

Task Assignment 99-003-00
December 2002

ASTROPHYSICS MISSION SUPPORT SERVICES
GSFC ATR - Dr. N. Gehrels
Raytheon ITSS Task Leader - Dr. J. F. Cooper
Raytheon ITSS Group Manager -

TASK OBJECTIVE: This task provides support and consultation services for the Compton Gamma Ray Observatory (CGRO) project scientist in areas of data management, analysis, and archiving for CGRP and for the HIC experiment on the Galileo spacecraft. This support includes attending GRO Science Working Group meetings, aiding target-of-opportunity decisions, monitoring the health of the spacecraft, and presenting GRO papers at scientific meetings. In addition, this task will provide consultation on data products from the HIC.

SIGNIFICANT EVENTS:

1. The Galileo Project has succeeded in restoring tape recorder operations on the Galileo Orbiter at Jupiter after a radiation-induced problem from the Nov. 5, 2002 flyby of Amalthea, so there are now good prospects for retrieval and analysis of Heavy Ion Counter data at high resolution from this flyby.

2. The Task Leader co-hosted a special session on space weathering at the Fall 2002 AGU Meeting and presented a talk on heliospheric weathering of Kuiper Belt objects in the outer solar system. He also presented a poster as a co-author with V. Shematovich (Russia) and R. E. Johnson (UVA) on modeling of Europa's thin oxygen atmosphere.

3. The Task Leader was also a co-author on another Fall 2002 AGU poster by E. C. Sittler (Code 692) on models and Voyager measurements for nitrogen atoms and ions in Saturn's magnetosphere. A new result of this work is that energetic particle populations in much of the magnetosphere may be dominated by nitrogen ions from Titan.

4. The Task Leader discussed collaboration with M. McGrath of the Space Telescope Science Institute on supporting STScI's lead science team proposal to the NASA Astrobiology Institute. This would couple the "Space Physics of Life" ideas to STScI's concepts for "The Astrophysics of Life", e.g. on the potential importance of geomagnetic fields for evolution of life on extrasolar planets.

5. Task staff continued to support the EGRET team on miscellaneous tasks.

UPCOMING MILESTONES/EVENTS:

1. A poster presentation on "The Space Physics of Life" will be given at the 2002 General Meeting of the NASA Astrobiology Institute at Arizona State University during Feb. 10-12, 2003.

2. The Task Leader will give an invited talk on heliospheric weathering of comets at the "First Decadal Review of the Edgeworth-Kuiper-Belt - Towards New Frontiers" workshop in Antofagasta, Chile during March 11-14, 2003.

PROBLEMS OR AREAS OF CONCERN:

Task funding for EGRET support activities past March remains uncertain.

RELATIONS TO OTHER TASKS:

Work on this task is being supplemented by support from the SSDOO project and one active Jovian System Data Anaysis Program contract with Raytheon ITSS. Support from an earlier JSDAP contract has now ended. Startup of new funding from a successful proposal to the NASA Planetary Atmospheres Program for work on Europa topics is awaiting receipt of final contract paperwork from NASA.

Funding from another contract on radiolytic chemistry modeling for Europa from the NASA Planetary Atmospheres Program will begin shortly.

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Task Assignment 99-101-00
December 2002

AMASE-MOCHA-CONCAT DEVELOPMENT
GSFC ATR - Dr. C. Cheung
Raytheon ITSS Task Leader - E. Shaya
Raytheon ITSS Group Manager -

TASK OBJECTIVE: This task provides support for the development of the object -oriented data base multispectral astrophysics data catalog, AMASE (Astrophysics Multimission Archive Search Engine) as an interface to NASA's astrophysics data holdings. This effort is a collaborative one with the University of Maryland (UMD) Computer Science Department, and frequent interactions with UMD counterparts are expected. The general goal for this performance period is to develop the AM ASE prototype into an astronomical search and discovery engine by expanding the data contents and augmenting the search capabilities. Work includes incorporating astrophysics data from other wavelength bands to complete the electromagnetic spectrum and developing procedures to access remote relational data bases.

SIGNIFICANT EVENTS:

A. DSA:

- Staff worked on XML telemetry language for OMG RFP.
- Staff is writing white paper summarizing this year's work.

UPCOMING MILESTONES/EVENTS: Resubmission of telemetry XML Language to OMG due January 6, 2003.

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Task Assignment 99-110-00
December 2002

AUTONOMOUS TECHNOLOGY
GSFC ATR - Dr. M. E. Van Steenberg
Raytheon ITSS Task Leader - R. Dunlap
Raytheon ITSS Group Manager

TASK OBJECTIVE: The objective of this task is to support the development of a simulation environment that supports autonomous distributed spacecraft control and test science collection techniques using artificial intelligence (AI) technologies. This work is in collaboration with the GSFC's Guidance, Navigation and Control Center and JPL's Automation and Control group. The contractor shall support the following activities and contribute to reports and white papers as appropriate: (a) evaluate Science Quick-Look Analysis Tools (e.g., HEASARC) for use as on-board analysis tools, (b) define Typical Science-Driven Maneuver Automation Requirements, (c) define Typical Science Automation Requirements, (d) define Basic System Architecture, and (e) develop rapidly a prototype to demonstrate key capabilities.

SIGNIFICANT EVENTS: No work was performed during this reporting period.

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Curator: *Natalie Jaquith*
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Last Revised: *Friday, 17-Jan-2003 10:26:26 EST [NAJ]*

Task Assignment 99-113-00
December 2002

GLAST
GSFC ATR - R. Fink
Raytheon ITSS Task Leader - J. Palencia
Raytheon ITSS Group Manager

TASK OBJECTIVE: GLAST is a multipartner gamma-ray survey mission with a GO observation component. The ADF will provide a prototype public archive design using Beowulf and other related technology. The prototype will implement the archive design using the Compton Gamma Ray Observatory EGRET data set. The contractor shall provide personnel to support the following tasks: (1) systems administration support of the Beowulf cluster and (2) programming support as requested for implementing the archive prototype.

SIGNIFICANT EVENTS:

- Staff was on travel from December 9, 2002 - January 6, 2003, therefore, this report includes only work performed during the week of December 2-6, 2002.
- Staff provided an introductory training session for system administrators on Bliss Beowulf Cluster.
- Staff provided system administration support for HPC's Beowulf clusters (MEDUSA & ORKA).
- Staff provided system administration support for MEDUSA workstations.
- Staff provided system administration support for the BLISS Beowulf cluster.

UPCOMING MILESTONES/EVENTS:

- Staff will implement a scheduler (OpenPBS/Raytheon GREE) on HPC's Beowulf cluster, THUNDERHEAD.
- Staff will create a user graphical GUI for LACE for HPC's Beowulf cluster, THUNDERHEAD.
- Staff will implement PVFS on the Code 630 BLISS Beowulf cluster.
- Staff continues to write and work on her thesis.

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Task Assignment 99-201-00
December 2002

IMAGE
GSFC ATR - R. Burley
Raytheon ITSS Task Leader - C. Klipsch
Raytheon ITSS Group Manager -

TASK OBJECTIVE: The objectives of the IMAGE Mission Data System task are to develop, test, and maintain the IMAGE Web data access and display system, the IMAGE data processing system, and the IMAGE data distribution system.

SIGNIFICANT EVENTS: No work was performed on this task during the reporting period.

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Curator: *Natalie Jaquith*
Responsible Official: *Dr. Joseph H. King, Code 633*
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Task Assignment 99-202-00
December 2002

MAGNETOSPHERIC MODELING AND ANALYSIS
GSFC ATR - Dr. S. Fung
Raytheon ITSS Task Leader - Dr. L. Tan
Raytheon ITSS Group Manager

TASK OBJECTIVE: This task calls for (1) the performance of analysis supporting the development of a new generation of trapped radiation, (2) the documentation and analysis support in an ongoing SSDOO research program on the outer magnetosphere, and (3) ISTP campaign coordination.

SIGNIFICANT EVENTS:

• Task staff prepared a document to describe the magnetospheric state parameter database including statistical notes on the content.

• Task staff used a java program to download NOAA trapped particle data within multiple time intervals as stored in CDAweb. Using the downloaded data he examined the trapped particle "basic state" environment under an extremely quite condition (Kp<=1, Vsw < 350 km/s).

• Task staff completed the revision of a paper entitled "Can Cusp-originated Relativistic Electrons be Identified in the Radiation Belt?" and prepared to re-submit it to *Geophysics Research Letters* soon.

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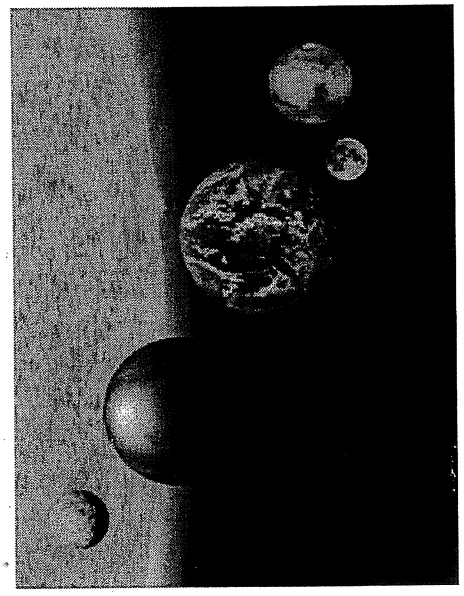
Task Assignment 99-203-00
December 2002

SPACE SCIENCE VISUALIZATION FACILITY
GSFC ATR - Dr. R. Kessel
Raytheon ITSS Task Leader - J. Friedlander
Raytheon ITSS Group Manager

TASK OBJECTIVE: The task of the Space Science Visualization Facility within the SSDOO is to support the SSDOO education and outreach activities, scientific analyses, and IMAGE mission activities. Members of the facility will need to work closely with the space science community in order to create appropriate space science videos, illustrations, and displays and to develop overall approaches and procedures for the maintenance of the task.

SIGNIFICANT EVENTS:

1. Staff created a photo-illustration of the inner planets as an accurate size comparison using latest imagery. The illustration will be used in a new astronomy text book being published by Harcourt College Publications. The request came from Jay Pasachoff, one of the authors.



2. Staff created a particle based simulation of the earths plasma ring current. Modified the simulation to adhere to the data that has been collected by the IMAGE satellite, created an HDTV movie of the simulation.

3. Staff made extensive modifications to the scripts of the Task Request system to support the needs of the Visualization Lab task. Tested part of the Task Request system after the above modifications and identified several other alterations required.

4. Staff illustrated 10 figures for the Space Science Data Operations Office (SSDOO) Chief for upcoming presentations and publications.

5. Staff collected 15 images from various web sites and manipulated them for inclusion on the Sun-Earth Connection Education Forum (SECEF) website.

6. Staff collected and completed 7 video "slugs" of recently completed animations and simulations. These slugs were put onto a Beta sp video tape at the request of Goeff Haines-Stiles who is producing a "Passport to knowledge" video for PBS. The shows theme will be on space weather and will use vislab animations for content.

7. Staff assisted in the creation and printing of several posters for presentation at the most recent AGU meeting. Posters included data archiving, XML, SOHO, and SDO efforts.

8. Staff assisted the Radio Jove team in resizing and re-compressing more than 20 quicktime movies for inclusion in an online version of an educational CD.

9. Staff updated several publications and presentations for the Space Science Directorate. Co-op brochures were printed and distributed to the Equal Opportunity visiting committee, pictures were added to PPT slides in two Jonathan Ormes talks.

10. Staff illustrated a holiday greeting for the SECEF team to be distributed through extensive e-mail list.

UPCOMING MILESTONES/EVENTS:

1. Staff continues to anticipate move to newly remodeled quarters.

2. Staff will complete Black Hole simulation for SSD presentation.

3. Staff will contribute heavily to proper sendoff for Dr. Joe King.

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Curator: *Natalie Jaquith*
Responsible Official: *Dr. Joseph H. King, Code 633*
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Task Assignment 99-204-00
December 2002

SPACE PHYSICS SOFTWARE DEVELOPMENT, SYSTEM MAINTENANCE, AND SPECIAL PROJECTS

GSFC ATR - Dr. R. McGuire
Raytheon ITSS Task Leader - T. Kovalick
Raytheon ITSS Group Manager -

TASK OBJECTIVE: The objectives of the space physics development task are to design, develop, document, support, and promote the re-engineering of the SSC Software Systems and the CDAW Graphics Systems. These software systems will support Satellite Situation Center (SSC) Operations, ISTP SPOF, SPDS, STEP, other NASA projects, and the space physics community in general. Accomplishing this objective requires maintenance of the software in both a UNIX and VMS environment, use of appropriate software development tools and methods, development of concise documentation, definition of new magnetospheric field and region models, and communication with scientists and end users both at the NSSDC and in the larger space physics community to ensure that their needs and requirements are being met. This task will work closely with the CDF/graphics task to fulfill its responsibilities. CRUSO in particular will play an important user support role for both SSC and the CDAW Graphics System. It will serve as the first point of contact for users, distribute documentation, answer simple questions, and forward software and science questions to this task and to SSC Operations.

SIGNIFICANT EVENTS:

1. Work on CDAWeb Software: Staff completed and distributed a document outlining the overall system architecture. Staff continued cleanup work on the CDFX suite of software and began work on some requested enhancements. Staff developed the software to implement a cdf merge/subset capability, the software is still being debugged and tested in the development environment. Staff worked closely with Dr. M. Goldstein to help him run the CDAWlib software on his MAC running OS X with IDL5.6; IDL has made some changes in their core software so the CDAWlib software had to be modified appropriately. Staff discovered, and is in the process of fixing, a few problems with the plot_map_images software with regard to the Polar K1 VIS dataset. Staff also discovered a problem with some Geotail data where some CDFs have the Epoch variable defined inconsistently (not with the same case), a software fix is in the works. Staff continued investigating the geographic registration problem long suspected by staff and recently reported by a user of the Polar UVI/VIS image data. Year end statistics were prepared and distributed to all of the appropriate people.

2. CDAWeb Design work: Staff developed a design for how to merge/combine the structures for datasets so that the variables from more than one dataset can be used when setting up virtual variables.

3. Work on SSCWeb Software: Staff is working on incorporating science staff suggestions into the new calculator web interface and underlying software.

4. CDAWeb Statistics: The statistics include GSFC, RAL, ISAS and EDC: CDAWeb fulfilled 5,869 plotting requests, 2,684 ASCII listing requests and 245 CDF delivery requests, where each request can contain more than one plot/listing/file; (RAL: 9, 9, 0), (ISAS: 334, 95, 4) and (EDC: 11, 2, 2); there were 114,718 total accesses (21.2Gb) to the rumba CDAWeb HTTP Server. The anonymous ftp site delivered 15.8 Gb of data; 53,241 CDF files and 150 software/document files to non-staff users. The "overall" ftp statistics file was updated and can be found at http://cdaweb/cdaweb/logs/FTPaccumulative_record.html. The monthly web server and ftp statistics files can be found at http://cdaweb/cdaweb/logs.

5. SSC Statistics: Usage statistics from ubatuba, are as follows: There were 49 accesses of the SSC Version 3.0 Main Menu; Locator was not executed; Query was not executed; the Data Base listing was not accessed; the Calculator was not accessed; the File Output option of the system was executed 49 times and the FTP option was executed 37 times.

6. Usage statistics for the Web-based versions of SSC Query and SSC Locator programs are as follows: The query_server was executed a total of 64 times; the tabular_server was executed a total of 1,095 times; the graphical_server was executed 726 times for a total of 1,885 accesses, excluding developers. In addition, the SPOF accessed the systems 33 times; SSC Operations staff accessed the systems once. The SSC Web pages (main page as well as any GIF, user's guide, etc.) were accessed 9,659 times, with 90 accesses by SPOF staff and five accesses by SSC Operations staff. The new TIPSOD application was accessed 318 times with 1,610 accesses to the database.

7. Mirror Sites: RAL, ISAS and EDC are retrieving their provided data and software updates on a regular basis through their FTP accounts. Usage statistics were received from RAL, ISAS and EDC this month; these numbers were incorporated into the CDAWeb statistics listed above.

8. Ingest/operational activities: The CDAWeb metadata generator and inventory plot generation software are being executed nightly. As part of this process, any new MAP, IMAGE, LANL, GOES, ACE, FAST, Polar, ISIS, Cluster and PWG (the new Polar/Wind/Geotail replacement for the CDHF) files are being "ingested" as well. In addition, the master cdf "notes" web pages were updated each week.

9. SPDAC support: Staff continued working on requested enhancements to the database and associated web interface to meet a new, Living with a Star, call for data.

UPCOMING MILESTONES/EVENTS:

1. A new RAID disk tower for the rumba machine is expected soon; plans are being made for its optimal configuration.
2. Staff will assist the ATR with providing documentation and the appropriate level of information to help define meaningful assignments for a new co-op student.
3. Staff will continue to work with the IMAGE project personnel to validate the CDAWeb displays of the IMAGE data.
4. Staff will continue testing and maintenance on CDAWeb and testing/enhancing all of the plotting and listing software.
5. Staff will continue testing, modifying, and documenting the CDAWlib software and associated Web pages.
6. Staff will continue testing and maintenance of the SSCWEb system.

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Curator: *Natalie Jaquith*
Responsible Official: *Dr. Joseph H. King, Code 633*
Last Revised: *Friday, 17-Jan-2003 16:06:37 EST [NAJ]*

Task Assignment 99-205-00
December 2002

SPACE PHYSICS DATA ACQUISITION AND VALUE-ADDED SERVICES
GSFC ATR - Dr. R. McGuire
Raytheon ITSS Task Leader - Dr. H. Hills
Raytheon ITSS Group Manager - T. Kovalick

TASK OBJECTIVE: The objectives of this task are four-fold: 1. to support space physics and information acquisition for NSSDC, including support for ingest to the near-line/on-line archive and/or for distribution as CD-ROMs; 2. to support value-added space physics services, including operation of the SSC, creation of new composite space physics data/model products, definition of science user requirements for SSDOO systems and other NSSDC data and information systems, and science-expert support for other efforts such as IACG and SPDS as appropriate; 3. to carry out selected archival research and mission planning activities, including publication of results; and 4. to provide logistics support as directed for working meetings related to SPDS, including travel reimbursement.

SIGNIFICANT EVENTS:

1. DIONAS INGEST:

a. ISIS: Ingest is on hold because of ongoing construction in the GSFC building that houses the digitization equipment and because of the hospitalization of the main project person (B. Schar).

b. SAMPEX: Routine ingest continued for all 4 (+2 CDF) Level-2 data sets to online, plus a single Level-1 dataset to off-line.

c. Wind/WAVES: Ingest of the composite CDF from three datasets continued normally. However, the PS and GIF files on nssdcftp need to be extended into 2002 (from 2000). The ingested GIF files are okay, but the ingested PS files were found to be unreadable/unprintable for data on and after 1 August 1996. This PS file problem has been fixed and the operations group will re-run the jobs to ingest the data correctly.

2. OTHER DATA INGEST:

a. Ulysses solar wind ion and electron data sets from the SWOOPS experiment were updated for Nov. 2002.

b. The IRIWeb software is being updated to IRI-2001.

3. Data Set Contacts:

a. After some months of confusion, R. Brechwald (U.Iowa) provided rewritten format descriptions for the VLF data sets. On a quick look, they appear flawless and intelligible. He will be provided with formal notification of approval/go-ahead soon.

b. Task staff reviewed test CDF files converted by D. Han from archived HDF files of the ACE spacecraft. Minor problems involving labels for column headers were identified for future resolution.

c. Draft data format documents were acquired for IMPACT experiment data to be taken by the two future STEREO spacecraft from P. Schroeder (UC-Berkeley). Merits of using CDF format for IMPACT and other STEREO data were discussed in a telecon with D. Larson (UC-Berkeley), R. McGuire, and D. Han.

d. URL links to all of their Wind 3DP data were received from D. Larson (U.C. Berkeley). After a follow-up phone call, e-mails were reviewed, and Larson was sent the relevant recent ones and the current 3DP skeleton table.

4. Support for Dionas Ingest Fields not previously filled in during the copy from the transfer database to the dionas_ingest database (Pioneer, Ulysses, OSO8, Wind, ...) were filled in. A few other fields were corrected for some entries, and the entries were approved as complete and correct. For greater clarity and control, an interim database was generated for DIONAS_Ingest, and the controlled database name was changed to include "control". In consultation with B. Rowland, the Wind WAVES entries and ten Ulysses datatype entries were corrected.

The "info" scripts for the Dionas_Ingest database were modified to automatically set defaults in two cases, and to restrict the special case number to a single digit.

An entry and update was made for the IMP LANL plasma dataset in the Dionas_Ingest database. Changes were made to

accommodate the new source (provider) and different input filenames.

5. SPDAC SUPPORT SPDAC entry for RHESSI was updated, and a new entry for TRACE was made. Both entries are fairly complete and up to date.

Information about the TIMED satellite, instruments, and data sets was entered into SPDAC.

As requested by the ATR, the single-page list of all the Missions in SPDAC was replaced by a set of four similar pages separating the missions into categories, plus the attendant related details including addition of two fields to the Oracle database. New fields (re NASA funding and sponsoring agencies) were populated for the SPDAC missions so that all now fall into the correct category.

6. Maintenance of NSSDC Information Databases:

a. Only one AGU journal was reviewed for keywording of experiments and for usage of data sets and models from NSSDC. This is due to continuing problems at AGU in bringing out printed versions on time.

b. Several URL links on the web pages were updated.

c. Information was updated into NMC for TIMED and its experiments, Coriolis and its experiment SMEI, an IMP 8 data set, and two Apollo 15 data sets.

d. Numerous URLs in nssdcftp readme files were corrected.

7. SSC Ephemeris

a. Ephemeris information was created and updated into the SSC's UNIX data base for 27 spacecraft. Files for four spacecraft were updated for the [ACTIVE.IACG.ELEMENTS] directory.

b. All FTP accessible files in nssdcftp/miscellaneous/orbits (and its mirror versions in VMS site) were updated. Updates of ephemeris files in Ubatuba/ SSCWeb continued satisfactorily.

8. The draft and final versions of SPX 589 were made available via WWW and FTP. SPX 590 was drafted and loaded online. It carries stories on 18 spacecraft (which is probably a record for one month). As usual, a copy of that was emailed to COSPAR. Seven WDC SI announcements (including one revision) regarding the launch and assignment of IDs to 17 missions were sent by e-mail and posted to the Usenet News. Two CCSDS IDs were assigned for future mission/simulation telecommunications.

The "Bright Objects" section of the web version of the SPACEWARN Bulletin was reported to be out-of-date, so corrections were made to the instructions as to how to generate the report from the GSFC OIG web site.

9. MAINTENANCE AND UPDATING ON THE VARIOUS WWW PAGES: a. Algorithms and Models on WEB:

Accesses for this month: CGM ..... 1127 IRI model ..... 1281 MSIS model ..... 1801 IGRF model ..... 549 TRAP particle model .... 250 T89 model ..... 28 T96 model ..... 46 Heliospheric Ephemerides 782 IMP-8 daily position ... 16

b. COHOWEB and OMNIWEB systems (data and software) 1. Updated OMNI CDF files from updated ASCII files and downloaded to OMNIWeb. 2. Updated corresponding OMNIWeb home pages 3. Updated IMF Polarity - gif and ASCII files and and corresponding home page. 4. Updated Magnetic field and Plasma coverage diagram for OMNIWeb.

Accesses for OMNIWEB: plots/list/scatter: 1481 / 526 / 73 = 2080 Accesses for COHOWEB: plots/list: 84 / 11 = 95

c. ATMOWEB system and FTPHelper (graphical browsing & retrieve FTP data)

d. FTP site (System software, data ingest, creation of CD-Rs)

1.

a. Updated OMNI hourly annual ASCII data files: IMF(from ACE) - through July 27. 2002; Kp - through October 2002; Provisional Dst - through September 2002;

b. Updated the OMNI daily and 27-day ASCII data files.

c. Updated ACE merged (plasma+mag. field) 4-min resolution ASCII data files from 64 sec. plasma data, and 4-min mag. data from ACE SCIENCE CENTER for NSSDCFTP site (up to July 27, 2002).

d. Acquired new LANL 2-min plasma data (01/00 - 10/01). Restructured the logical records and sent to B. Rowland for DIONAS ingest.

e. Cosmic and Heliospheric pages and services

f. Geomagnetic and Magnetospheric Models through network

g. Space Physics home page

1. Updated some space physics home pages: Found and fixed the bug in the data_by_service.html page New TIMED home page and linked this home page to main Space Physics home page for searching "Data by spacecraft"

10. Special Tasks for Joe King:

a. Building of scatter plots with linear regression of LANL/MIT plasma data with real deviations and make them accessible through FTPBrowser.

b. Building of scatter plots with linear regression of LANL/MIT plasma data with real deviations and log scale and make them accessible through FTPBrowser.

11. Meetings, Presentations, and Publications

a. A task scientist and C. Tranquille (ESTEC-ESA) jointly prepared and circulated a data survey to the Ulysses experiment teams on behalf of the Ulysses Project.

b. The Ulysses acquisition scientist responded on behalf of the Ulysses Project, by request of E. Smith (JPL), to an on-line data survey distributed by R. Walker (UCLA) for Sun-Earth Connections missions.

c. A task scientist co-hosted a special session at the Fall 2002 AGU Meeting in San Francisco on space weathering and presented a talk on heliospheric weathering of comets in the outer solar system.

d. Several viewgraphs were prepared for a poster presentation by J. King during the AGU Fall meeting in San Francisco about NSSDC's online services.

e. A paper was reviewed for Annales Geophysicae.

f. A supplementary grant proposal was submitted to NSF for support of the 2003 IRI Workshop at Rhodes University in Grahamstown, South Africa.

g. The final collection of papers from the 2001 IRI Workshop was assembled and submitted to Advances in Space Research for publication (D. Bilitza, editor).

h. The plans and agenda for a session on data assimilation and data-based models during the AGU/EGS Spring meeting was discussed with the co-convenors (R. Schunk, L. Scherliess, V. Papitashvili).

REQUEST HIGHLIGHTS:

a. Several requester were assisted with inquiries regarding ITM data and models:
S. Mishra (NPL, India)) - IRI usage Shenjie Ge (Ohio State U) - IRI papers and software R. Shroll (Spectral Sciences Inc) - NRLMSISE-00 T. Cayton (LANL) - AP8 model.

b. A 300-dpi image of ISEE3/ICE's trajectory maneuvers from launch to halo orbit to comet exploration was sent to a requester, to appear in an article in the January issue of Engineering & Science magazine, and also be posted online (http://pr.caltech.edu/periodicals/EandS/). The magazine, with 24,000 circulation, is Cal Tech's alumni magazine. The photo is in the public domain; requester was asked to credit NASA GSFC and NSSDC.

ACTIVITY LOG:

The NSSDC models sites on anonymous ftp and on the Web continue to be very popular:

ftpWWW
2002 RAID Model atm geom ion rad solar CGM IRI MSIS IGRF TRAP hpage

Jan 154622 4926 968 819 2377 324 273 1505 3399 8270 454 244 69610
Feb 116199 7092 1078 659 3651 619 525 1106 2322 41633 475 621 71078
Mar 164875 10177 1869 1462 4682 640 740 717 1659 5257 528 161 73074
Apr 245162 6863 1134 884 3665 353 319 899 2220 1162 1266 122 74803
May 275487 4426 754 537 2208 305 261 1050 8238 944 1346 93 76584
Jun 133327 6892 891 709 3693 388 371 47412641 1055 702 84 78218

ALL Model atm geom ion rad sol IRI MSIS CGM IGRF TRM
Jul 230906 8669 1559 993 4133 538 499 645 4486 570 491 42
Aug 229827 6819 1234 934 2869 521 485 701 1953 983 510 65
Sep 184116 10238 2034 1123 4441 691 754 587 1832 811 449 543
Oct 252019 8551 1664 1209 3327 744 609 996 4055 1075 917 330
Nov 247324 9864 2019 1221 4213 577 777 6439 1573 1382 717 466
Dec 1281 1801 1127 549 250

==========

-------- ISIS ----------
Files GBy Total WWW I AE Aer DE Exp Hi I/A OGO SM SNOE
----------I----------
Jan 26,410 15.1 531.6 5640 I1396 43154 11 44 13 47379 29035
Feb 10,342 6.1 537.7 5736 I 25 5 371 3 22 836 8 29 4176
Mar 20,492 12.0 549.7 5917 I 179 18 48 99 83 78 27 17 14263
Apr 17,460 9.2 558.9 6057 I 50 215 15 5 22 1 5 16365
May 19,126 15.4 574.3 6257 I 52 9 271K34 30 15 19 213 2

------ ISIS ----------

Files GBy Total I ITM TOPIST ATMOWeb

Jun 16,552 9.5 583.8 I 1,954 0
Jul 17,192 14.9 598.7 I 1,908 65,255
Aug 21,077 12.3 611.0 I 2,594 58,241
Sep 15,419 8.3 619.3 I 1,805 928
Oct 21,969 10.1 629.4 I 32,249 16,586 DE2/LAPI:11371, ISIS:19950
Nov 1,612 0.9 630.3 I 4,704 4 AE:3003 DE:993 ISIS:574
Dec 0 0 630.3 I

ITM: AE-C,D,E, Aeros, Alouette, ISIS, DE-1,2, Explorer 22, 31,32,
Hinotori, SNOE, OGO-6, SanMarco
==========

WWW file and plot accesses during November 2002 (and the yearly totals) for interplanetary COHO-related data from COHOWeb, CDAWeb, and NSSDCFTP: Deep Space (Ulysses, Voyager, Pioneer, etc.): 9,314 {2002 Total: 57,271}
Geospace (IMP-8, Prognoz, ACE, WIND, SOHO): 27,648 {2002 Total: 285,034}

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Curator: *Natalie Jaquith*
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Task Assignment 99-301-00
December 2002

COMPUTER SYSTEMS MANAGEMENT TASK
GSFC ATR - C. Barrett
Raytheon ITSS Task Leader - J. Jacobi
Raytheon ITSS Group Manager

TASK OBJECTIVE: The objectives of this task are to provide systems analysis and technical support to the operational computer activities of the NSSDC; to maintain existing hardware and system-level software to ensure the optimal performance and utilization of its resources and connectivity to its computing sites; to integrate new hardware and system-level software into existing systems to achieve upgraded capabilities and state-of-the-art facilities; to administer specialized software such as data base and optical disk management systems; and to provide users with the necessary documentation, training, and assistance so that NCF resources are fully utilized.

SIGNIFICANT EVENTS:

- Staff used a combination of manual and automated methods to quickly and accurately change 400+ civil servant e-mail addresses in the Majordomo list server configuration to comply with "OneNASA" requirements.

- Staff resolved IRAF problem on dublin that was caused by missing pipe files, a common interprocess communications mechanism on Unix systems.

- Staff resolved system-board/memory problem on dublin by swapping in spare system-board and memory.

- Staff configured a new systems administration server with the hostname panhead.gsfc.nasa.gov.

- Staff set up tools for using signed patches on java. Also setup the tool for automatically obtaining needed patches. Some false negatives have been reported and a patch retrieval schedule has not yet been established.

- Staff performed two back-to-back operating system upgrades on Delphi, our Oracle database server. This involved stopping and disabling Oracle, adding a new external disk drive to the system, making a copy of all operating system files to this external disk, editing the fstab file to accomodate a pending change in the file system supported by the upgraded operating system, updating the firmware for all devices other than the FDDI driver. Staff requested help on this driver issue and had this request declined by HP, then decided to proceed with the upgrade using the existing FDDI driver firmware. Staff successfully upgraded to version 5.0a of Tru64 Unix, checked customized config files for changes that may have happened as a result of the upgrade, upgraded to 5.1a. Checked for new processes that may have been started by the upgrade, checked release notes and applied all cumulative patch sets, applied subsequent individual patches, restarted Oracle, and check the log files.

- Staff researched single sign-on. There are facilities in some versions of the Tru64 and Linux operating systems. Still checking Solaris and Irix.

- Staff is continuing work on setting up the upgraded apache server on Java. Finally compiled successfully, and got the new server to work with tomcat.

- Staff investigated the current crop of tools for detecting weak passwords in preparation for checking the passwords on the servers.

- Staff continued to perform routine system administrative duties, including backups, application of software upgrades and patches, providing assistance to users, and maintaining the IP spreadsheets and equipment database.

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Task Assignment 99-302-00
December 2002

SYSTEMS NETWORKING AND SMALL SYSTEMS
GSFC ATR - G. Goucher
Raytheon ITSS Task Leader - R. Dunlap
Raytheon ITSS Group Manager -

TASK OBJECTIVE: The objective of this task is to provide network engineering support to Code 600.

SIGNIFICANT EVENTS:

- Staff supported a workshop in building 32 for SECEF.
- Staff continues to upgrade Windows PC's to Windows 2000 OS.
- Staff continues work to develop the Code 630 Web-based equipment data base.

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Task Assignment 99-303-00
December 2002

NSSDC COMMON DATA FORMAT (CDF)
GSFC ATR - D. Han
Raytheon ITSS Task Leader - M. Liu
Raytheon ITSS Group Manager - T. Kovalick

TASK OBJECTIVE: The objectives of this task are to carry out computer science research, develop computer software and provide user support for the NSSDC Common Data Format (CDF).

SIGNIFICANT EVENTS:

1. The commercial packaging software is still being evaluated on Windows for installing our CDF distribution. It has been tested on Windows NT but more tests are being done on other Windows platform, e.g., 98 and XP.

2. 64-bit mode running on the Solaris Sparc machine running was successfully added to the CDF support port.

3. A bug correction and minor update to the CDF Java-based tool program was implemented.

4. Three user requests/questions were handled this month.

CONCERNS AND PROBLEM AREAS:

1. The GZIP compression/decompression option is turned off for 16-bit DOS/Windows 3.x due to its memory constraint.

2. A unusual problem occurs with the older Microsoft C 7.00 compiler in one of the EPOCH parsing routines on DOS/Windows 3.x. It occurs while using the floating point functions and type casting. It is suspected that the Microsoft executables may be getting too large and will require memory overlaying.

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Task Assignment 99-304-00
December 2002

PLES
GSFC ATR - N. James
Raytheon ITSS Task Leader - Dr. D. Williams
Raytheon ITSS Group Manager - T. Kovalick

TASK OBJECTIVE: The objectives of this task are to maintain data bases and metadata (NMC, WWW) for planetary, Earth sciences, and selected astrophysics data (HEASARC, EUVE, HST), provide request support and coordinate updates of user interfaces, coordinate WWW activities, support internal and external data base users, assure data set quality, coordinate planetary data acquisition and Earth science data transition, support educational activities, and coordinate publications.

SIGNIFICANT EVENTS:

- The NSSDC WWW server had a total of 8,913,036 error-free accesses logged for December 2002, a decrease of 31% compared to November 2002. A loss of server logs for nearly six days is estimated to account for 20% of this drop-off.
- The NSSDC WWW server had a total of 139,763,534 error-free accesses logged in 2002 compared to 137,058,278 in 2001, an increase of 2%.
- Task staff responded to over 200 e-mail queries and telephone calls from external users and the Request Office.
- Task member updated the NIMS and CD-ROM Catalog information for the Galileo NIMS CUBE data set resulting from the receipt of a new CD-ROM in the set.
- Task personnel helped create an image of the terrestrial planets for use in an astronomy textbook.
- Task staff added the books "Evolution of the Solar System" and "Origin of NASA Names" to the page on online books.
- Task member added atmospheric masses to the fact sheets on the terrestrial planets.
- Task staff worked on completing material for the IMPACT educational web pages, due to be completed in January 2003.
- Task member updated the spacecraft pages for the CONTOUR, Rosetta, and NEAR-Shoemaker missions and added information on the four new proposals selected as finalists for the 2007 Mars Scout mission.
- Task personnel completed transition to the QSS sub-contract.

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Task Assignment 99-305-00
December 2002

NASA SCIENCE OFFICE OF STANDARDS AND TECHNOLOGY (NOST)
GSFC ATR - D. Sawyer
Raytheon ITSS Task Leader - J. Garrett
Raytheon ITSS Group Manager

TASK OBJECTIVE: The objective of this task is to maintain and expand the NOST so that it can effectively respond to the standards needs of the NSSDC community.

SIGNIFICANT EVENTS:

NOST Archiving Tools Suite - Staff has

- Continued coding the first version of the Multifile Package Group Analyzer (MPGA) tape packaging software. The first version of the Module Library is complete. Mapped out the functionality of the By Directory Module and the Templates Library.
- Participated in both general and detailed meetings regarding the upcoming tape migrations. Discussions at the general meetings centered on work flows, schedules and outstanding issues. Discussion centered on determining needed attributes and sources of the attributes. Also held internal meetings discussing design, features, and status of software.

ISO Data Archiving - Staff has

- Reviewed and commented on the draft Producer-Archive Interface document. Participated in teleconference addressing all comments received.
- Updating the ISO Archiving web site with some few new materials.

CCSDS On-Line Information System -

- OLIS activities are now part of a GST subcontract and will no longer be reported here.

CCSDS Standards - Staff has

- Participated in the GSFC Standards Coordination Working Group meeting.
- Reviewed *Orbit Data Messages* and provided PVL versions of messages show in the examples in the document.

Goddard Technical Standards Coordination - Staff has

- Updated the web site to detail a number of completed and upcoming GSFC reviews of standards.
- The primary CCSDS Web Site was transferred to the new contractor. The new web site is not layed out the same as the classic site. Also not all of the information on the classic site was transferred to the new site. Therefore all links to CCSDS web site had to be reviewed and updated. For simplicity and to reduce bandwidth most links were updated to point to the classic site which is still being maintained on site here.
- Update web sites and mailing lists with OneNASA email addresses for GSFC personnel. Will have to update web sites and mailing lists again as other centers implement oneNASA mailing addresses for their personnel.
-

STATISTICS: CAOIS: As of 31 December 2002, there were 442 Data Description registration numbers assigned. Of these about 30 of the Data Description registration numbers are reserved for NSSDC use during the Cygnet migration, 45 are reserved for IMAGE ingest, 26 for ISIS ingest, and 2 for Skylab. Data Description Packages for these must be generated.

UPCOMING MILESTONES/EVENTS:

NOST Archiving Tool Suite: Staff will

- Complete coding the first version of the Multifile Package Group Analyzer (MPGA) tape packaging software. This includes coding the main parts of the "VMS-By-Directory", "AIP-Generator", and "VMS-File Getter" Modules.
- Begin coding the multi-file version of the AIP Extractor.
- Continue to participate in tape migration meetings.

CCSDS XML Group: Staff will

- Continue low level of support for possible CCSDS XML prototype effort.
- Participate in upcoming joint CCSDS and OMG meeting, when convenient.
- Assist as needed in presentations for Metadata Registries Open Forum.

CCSDS Standards: Staff will

- Review the new draft of the Orbit Data Messages standard and propose updates using PVL and XML for the syntax.

Goddard Technical Standards Participation: Staff will

- Participate as needed in the GSFC Standards Working Group, the NASA Data System Standards Council and the GSFC Standards Review Boards.
- Continue updates for the web site for GSFC Standards Coordination. Update web site to reflect updated standards management.

CAOIS: Staff will

- Register new data description packages as they are submitted. Note that Cygnet migration, IMAGE ingest, ISIS ingest, and Skylab descriptions still need to be submitted.

Formats Evolution Process - Staff will

- Updating the FEP Web site if any new material is submitted.

ISSUES:

OLIS:

- The contract to GST for CCSDS Secretariat Support for December 2002 to October 2003 has been completed. GST sent a subcontract SOW (for 11 months) to Raytheon and Raytheon has responded. We are currently waiting on GST approval. When approved, I will restart work on the follow on Web Support Subcontract. Hopefully this will be completed early in the coming month.

GSFC Standards:

- Since the new CCSDS web site has a different layout and different naming conventions, pointing www.ccsds.org to the new site has resulted in most links from GSFC sites, search engines, portals, previous technical papers, etc. to become broken. Since the classic CCSDS site will be maintained during some transition period, the links can be made workable again by substituting wwwclassic.ccsds.org for www.ccsds.org in broken links.

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Task Assignment 99-306-00
December 2002

INFORMATION (METADATA) SYSTEMS DEVELOPMENT AND UPGRADES
GSFC ATR - Dr. J. Thieman
Raytheon ITSS Task Leader -
Raytheon ITSS Group Manager - T. Kovalick

TASK OBJECTIVE: The objectives of this task are to define and develop information systems and the interfaces thereto, maintain these systems and interfaces and support the generation of reports therefrom, and recommend and participate in the planning of upgrades to necessary support systems and software as appropriate.

SIGNIFICANT EVENTS:

- An article for the NSSDC Newsletter was written on the work surrounding the development of JIN.
- Testing of both JIN and the development version of the Task Request system were conducted following the update of the NIMSDEV database.
- Design issues related to JIN were investigated.
- Stored procedures and related JDBC code for get/set functions were modified for media tape and dataset information.
- Two bugs in JIN, one with associating a media with another media, another that occurred in JIN when adding a new tape, were fixed.
- Issues pertaining to database corrections for the med_sign_in_out table were addressed.
- Modifications were made to the Task Request system pursuant to Task Request numbers 1153 and 1159.
- Activity diagrams (flowcharts) were prepared for both the sign-in and sign-out processes as well as descriptions for each.
- Some erroneous author information in NIMS was corrected for B. Anderson (QSS).
- One CD was added to the CD-ROM Catalog.

UPCOMING MILESTONES/EVENTS:

- Work will continue on JIN.
- An upgraded version of the Task Request system will be implemented.

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Task Assignment 99-307-00
December 2002

SUN-EARTH CONNECTION EDUCATION FORUM (SECEF)
GSFC ATR - Dr. J. Thieman
Raytheon ITSS Task Leader - Dr. S. Odenwald
Raytheon ITSS Group Manager - L. Mayo

TASK OBJECTIVE: The objective of this task is to provide administrative support of the SECEF managers and assistance in preparing for educational outreach events, seek opportunities to leverage SECEF activities for broad national impact, and assist in publicity for the SECEF by developing content for a Web site and publications.

SIGNIFICANT EVENTS:

- Staff is planning for 2004 Venus Transit. Draft events and programs planning document.
- Staff is developing script for NASA/CONNECT Northern Lights program in Norway.
- Coordination meeting with Management for Venus Transit 2004.
- Teleconferences with Maryland Science Center to define tasks in support of Venus Transit 2004.

UPCOMING MILESTONES/EVENTS:

- Staff will continue with the planning for the 2003 Sun-Earth Day.
- Staff will continue planning for Venus Transit 2004.
- Staff will continue with scheduled EPC meetings.

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Task Assignment 99-312-00
December 2002

ANALYSIS SUPPORT FOR THE IMAGE MISSION
GSFC ATR - Dr. J. Green
Raytheon ITSS Task Leader - L. Garcia
Raytheon ITSS Group Manager - T. Kovalick

TASK OBJECTIVE: The objectives of the Analysis support for the IMAGE Mission task are to maintain and update local copies of the IMAGE software suite, create RPI data analysis software, and to create software to be used in correlative studies between IMAGE detectors and between IMAGE and other missions. This task will also support the synthesis of data and theory in the study of Earth's magnetosphere through creation of unique data products and services. This task will make available appropriate documentation for all of these objectives and will support the IMAGE Science Center Web site.

SIGNIFICANT EVENTS:

- Plots of web accesses to the IMAGE Science Center and POETRY web pages for the quarter between early September 2002 and early December 2002 were produced and sent to J. Green.

- Daily spectrograms for the RPI instrument for October 2002 were made available on the IMAGE Science Center site.

- Posted Collier ASR paper on the IMAGE publications site and added four new abstracts and references for the Fall 2002 AGU meeting

- Resubmitted the manuscript now entitled, "Observations of the Latitudinal Structure of Plasmaspheric Convection Plumes by IMAGE-RPI and EUV" by L. N. Garcia, S. F. Fung, J. L. Green, S. A. Boardsen, B. R. Sandel, B. W. Reinisch to the *Journal of Geophysical Research* .

- Upgraded the local copy of the software package euv_imtool, the image analysis tool for IMAGE EUV data developed at the Universotu of Arizona. Current version is 1.2. Added EUV data files to the UDF archive on the RPI team Solaris computer for testing this new software.

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Task Assignment 99-313-00
December 2002

COMMUNITY COORDINATED MODELING CENTER
GSFC ATR - Dr. M. Hesse
Raytheon ITSS Task Leader - M. Kuznetsova
Raytheon ITSS Group Manager - T. Kovalick

TASK OBJECTIVE: This task will provide science and software support for Community Coordinated Modeling Center (CCMC). Specific support includes developing and testing of simulation codes for space weather models, performing simulations of realistic space weather events, providing visualization and analysis software, performing comparison of modeling results to satellite measurements, performing research in space plasma physics.

SIGNIFICANT EVENTS:

1. Staff presented papers on AGU Fall Meeting:
    - Effects of Ionospheric Conductance on Ionospheric Potentials,
    - Integrated Field-Aligned Currents and Magnetosphere in Two MHD Models
    - Study in Magnetic Neutral Points and Their Effects on Magnetosphere Dynamics
2. First test run using the CTIP ionospheric-thermospheric model is available for verification by model developers through web visualization.

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